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14. ABSTRACT The purpose of this report is to summarize briefly the history of the Surface Water Research project since its inception in 1952, the work accomplished, and the problems encountered. In general, each topic is discussed under two periods of time: 1952-1963, when projects were confined to the Helmand River Valley and was entitled "Helmand Surface Water Investigations (306-12-021, 306-M-12-AD and 306-AC-12-AD5)," and 1963-1969 when activities were expanded to cover most of Afghanistan and title was changed to "Surface Water Research (306-11-190-002)". Prepared by the United States Geological Survey in cooperation with the Water and Soil Survey Department, Ministry of Agriculture and Irrigation, Royal Government of Afghanistan under the auspices of the United States Agency for International Development. 18 appendices.					
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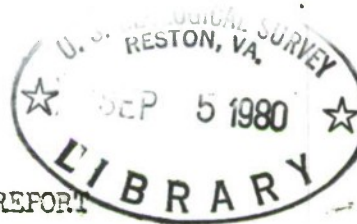
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UNITED STATES OPERATIONS MISSION
TO AFGHANISTAN
INTERNATIONAL COOPERATION ADMINISTRATION
LASHKAR GAH, AFGHANISTAN



TWO YEAR TOUR REPORT

by

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November 1959 to November 1961

GENERAL

The writer arrived at Lashkar Gah November 18, 1959 to succeed L. J. Snell, 1952-57, and I. A. Heckmiller, June 1954 to June 1959. The hydrology work for the Helmand River Valley was being handled out of offices located in the Bank building and continued from there until May 1961 when the offices were moved to the new H.V.A. office building in Lashkar Gah.

PROGRAM

The project objectives have remained the same, being basically two-fold, that is (1) to collect the basic hydrologic data, stream flow records and weather data necessary to intelligent operation and planning of water use, and (2) to develop a staff of Afghan personnel competent to carry on the work of the unit.

The end result of stream-flow investigations, climatological observations, and hydrologic studies is a compilation of records and data with which to more intelligently design and operate water-utilization projects whether for flood protection, irrigation or power production.

As indicated below the writers time in the office has been largely devoted to the analysis, computation and compilation of records that have been collected. The objective is to have all hydrologic data collected in the Helmand Valley through September 30, 1960 published in a single book.

Reports computed and distributed at intervals are:

a. Monthly Hydrologic Summary. These summaries include comments on weather conditions, table of temperature, precipitation, evaporation, humidity, and wind for Lashkar Gah, and a table of reservoir operation

data, that is: month-end elevation and contents and change in contents. Comments on runoff expectancy are also included.

b. Reservoir Operation Records. Operation records for both Arghandab and Kajakai reservoirs are prepared and distributed monthly. These include detailed data of daily reservoir inflow, release, elevations, change in contents, and gate openings and/or changes.

c. Annual Records of Stream-Flow and Reservoir Contents. The final records, on a water-year basis (Oct. 1 to Sept. 30) with supporting data, such as list of discharge measurements, rating curves and tables, datum and rating analysis, and station description are computed and prepared for use of interested persons or activities and are available in this office.

SUPERVISION AND OPERATION OF STREAM-FLOW STATIONS

During the last two years the following gaging stations have been operated and records computed for each as indicated below:

Helmand River near Dehraout, a recorder, currently operated, records computed for Oct. 1, 1958 to September 30, 1960 and compiled for 1952-60.

Tirin River at Dehraout, a recorder, currently operated, records computed for Oct. 1, 1958 to Sept. 30, 1960 and compiled for 1952-60. The gage well was moved across the river in July 1961 to get it to where the river had moved.

Kajakai Reservoir, a recorder, currently operated, records computed for Oct. 1, 1958 to Sept. 30, 1960 and compiled for 1946-60.

Helmand River below Kajakai Dam, a recorder, currently operated, computed for Oct. 1, 1958 to Sept. 30, 1960 and compiled for 1946-60.

Musa Qala River at Musa Qala, staff gage, currently operated, but a poor station, computed for Oct. 1, 1955 to Sept. 30, 1956 and compiled 1952-60.

Seraf Canal at Sanguin, staff gage, currently operated, computed for Oct. 1, 1953 to Sept. 30, 1960 and compiled for 1952-60.

Arghandab River above Arghandab Reservoir, recorder, currently operated, records computed for Oct. 1, 1958 to Sept. 30, 1960 and compiled for 1951-60.

A discharge measurement cableway was erected in January 1960.

Arghandab Reservoir, a recorder, currently operated, records computed for Oct. 1, 1958 to Sept. 30, 1960, compiled 1952-60.

Arghandab River below Arghandab Dam, a recorder, currently operated, records computed for Oct. 1, 1958 to Sept. 30, 1960 and compiled 1947-60.

Arghastan River near Kandahar, a recorder put back in operation in October 1960, records computed for Oct. 1, 1955 to Sept. 30, 1958 and compiled for 1952-53, 1955-58.

Gage well was moved and recorder reset in October 1960.

Arghandab River near Qala Bist, a recorder, currently operated, records computed for Oct. 1, 1958 to Sept. 30, 1960 and compiled for 1947-60.

Helmand River at Darweshan, a recorder, currently operated, records computed for Oct. 1, 1958 to Sept. 30, 1960 and compiled for 1956-60.

The recorder at this station was replaced with a water stage and temperature recorder in August 1961.

Helmand River near Chahar Burjak, a recorder, currently operated, records computed for Oct. 1, 1958 to Sept. 30, 1960 and compiled for 1946-60.

Helmand River at Shela Charkh, a staff gage put back in operation September 1960, records computed and compiled August 1955 to Sept. 30, 1957.

Khash River near Dilaram, a recorder, currently operated, records computed for Oct. 1, 1957 to Sept. 30, 1960 and compiled 1952-60.

Farah River near Farah, a recorder, currently operated, records computed for Oct. 1, 1957 to Sept. 30, 1960 and compiled for 1952-60.

Supplemental data to the above continuous records have been: miscellaneous measurements on some karizes in the Kandahar area, the Tarnak River near Kandahar, and on some of the canals in the Chakhansur Basin.

Rating of canal control structures has awaited the arrival of boat measuring equipment so that the control structures at strategic points can be rated. A few discharge measurements have been made however on the Boghra Canal at wasteway No. 1 and on the Darweshan and Hazerjuft Canals near Darweshan.

CLIMATEOLOGICAL RECORDS

During the past two years of rainfall, temperature, humidity, wind velocity and evaporation have been collected at Lashkar Gah and Kala Kang. Rainfall, temperature and evaporation records have been collected at Darweshan since July 1960 and records of precipitation and temperature have been collected at Panjoa since June 1960.

A survey of the snow courses in the vicinity of Ghazni was made in February of 1960 and 1961 and in 1961 these courses were supplemented with another in the Shiniz River Basin just over the divide north of Ghazni.

The Nawar Basin, west of Ghazni has been visited twice with a view to begin records of stage on the lake of that large land-locked valley for use as a runoff indicator, but until adequate access and instrumentation is worked out this will have to wait. A record on an outflow spring may be the answer yet.

ANALYSIS OF RUN-OFF RECORDS

During 1960 the writer made a summarization of the 13 years of record at each of the reservoirs by monthly runoff and determined the median monthly runoff for each month. These median monthly runoff figures have been utilized in setting up the proposed schedule of reservoir operation for both 1960 and 1961 which were furnished the Operation and Maintenance Section of H.V.A.,

RESERVOIR SEDIMENTATION STUDIES

During January and February 1961, 21 cross-sections were taken in the upper half of Arghandab Reservoir. This data has not been completely analyzed for lack of office personnel and press of other work. This type of analysis requires a large field staff and entails analysis of considerable field data to secure reliable results. We plan on introducing sounding equipment that will permit a more rapid assessment of the sedimentation with less manpower both in the field and office.

HYDROLOGY UNIT AFGHAN PERSONNEL

Mir Akbar Resa: Technically Mir Akbar has been the director of the Hydrology Unit but at no time has he applied himself to a mastery of the details of stream-gaging or computation of records and so his supervision of the unit has been superficial and since November 1960 he has been in Kabul representing the Afghan government on the Special Fund of United

Nations Natural Resources Investigations.

Ghulam Dostagir Sham: September 1959 to present. Sham came to the unit with a B.S. degree in Civil Engineering from the University of Wyoming. He had trained as a structural engineer so to work in hydrology required considerable re-orientation. After working indifferently for about a year he finally settled down to conscientious application to the job and is now working more effectively. He is capable of becoming competent and should become a good engineer, director for the unit.

Hasan Ali Tayeb: June 1954 to August 1955, April 1959 to present. A graduate of Afghan Institute of Technology, September 1955 to June 1956 at University of Wyoming, July 1956 to February 1959 at University of Nebraska enrolled in Civil Engineering. He worked in Geological Survey, Lincoln District office, obtaining practical training. His grades in September 1958 were below requirements and he was soon recalled.

He is developing competence in both field and office functions. His command of english is good and he helps the other men understand the procedures to secure good dependable results. Pay is inconsistent with his service. He has been recommended for participant training at Roarkee University, India to permit him to secure a bachelors degree in Civil Engineering-Hydrology and if RCA cleared will probably leave in 1962.

Abdul Jabor Haideri: October 1960 to present. Abdul Jabor is a graduate of Afghan Institute of Technology and had about six years experience on construction work before coming to Hydrology. He is developing ability in field and office work, but still needs considerable supervision as his initiative is not equal to his competence. Abdul Jabor has been recommended for four years of participant training in Civil Engineering in the United States to begin in 1962.

Abdul Khaliq: December 1952 to present. He is an able field man being able to supervise construction work, make discharge measurements and service the gaging stations. He can do simple office computations, but dislikes all office work and does little to train other men and resents direction by Afghan personnel.

Aziz Ahmad: July 1955 to time of his death, August 16, 1961. Aziz was a graduate of Afghan Institute of Technology. He was a good man, tried to do good work, but required close supervision of his work. The office will feel his loss. He had been scheduled to leave for Roarkee University for Engineering training in September 1961.

Abdul Nasrullah: August 1957 to present. Completed 9 class, Kandahar. Attended Helmand Valley Authority Class in surveying and is currently taking high school studies in the Lashkar Wah Afghan school on a part time basis. He is developing competence and now handles limited office and field work well. He does the office typing in english and has a fair command of english. He is dependable, works effectively and seeks to know the why of things.

In addition to the above technical staff the following Afghan supporting staff have assisted. These speak none or but slight english.

Abdul Hakim: Dec. 20, 1959 to present - secretary-time keeper

Abdul Ghani: Driver

Noor Mohammed: Driver

Jalaladine: driver

Hafizullah: Warehouse man

This means that the present staff consists of five men of some degree of competence in hydrology work of whom we must plan on two leaving for participant training in 1962. There should be at least three more high school graduates added to the staff immediately to prepare the unit for continued operation of the current network of stations.

HELMAND VALLEY AUTHORITY PARTICIPATION

The HVA has provided an adequate budget of funds to:

Provide vehicles and transportation costs for serving the gaging stations and climateological stations.

Pay for observers or watchmen at the stations.

Pay for an adequate unit staff if they could be found even though the pay is low and Lashkar Gah is considered a poor place to live by many Afghans.

Pay for needed locally procurable supplies for construction and maintenance of the gaging stations.

Provide office and warehouse facilities to accommodate the needs of the Hydrology Unit.

INTERNATIONAL COOPERATION ADMINISTRATION PARTICIPATION

The ICA provides:

The services of an American Technical Advisor on Hydrology.

A vehicle and transportation costs for the technician.

The necessary scientific and operational equipment essential to the effective operation of the Hydrology Unit and which must be procured abroad.

RECOMMENDATIONS

In the Unit:

Encourage the Afghan staff to work pride and responsibility in the job that is theirs.

Continue to program work and assist staff to develop competence to carry out assignments.

Give instruction on process of analyzing the base data collected and therefrom complete the records of runoff and summarization of results.

To stimulate an awareness of importance of the work of which their job is a part.

Continued organization and training of the staff into an effectual, dependable operating unit.

To Helmand Valley Authority:

Immediate recruitment of at least three more 12th grade graduates for in-service training with the unit.

Give acknowledgement for improved competence with on-job training by making pay adjustments conducive to job continuance in that field of training.

Discontinue the practice of having an absentee Director of the Hydrology Unit.

To International Cooperation Administration:

Continue the services of a technical advisor in hydrology at least for a few more years with the objective of slowly freeing him from computation of routine records so that he might conduct research and studies.

on use of the basic data for better water utilization. This activity could also stimulate the Unit's staff, to better appreciation of the work in which they are engaged.

The supply of needed special equipment is also basic to reaching project goals, but an improvement in pipe line of supplies could apparently be made by ordering more expeditiously in Kabul.

